

APPENDIX B
Complete Set of "Clean" Claims
37 CFR 1.121(c)(3)

3. A coaxial resonator comprising:
an inner conductor formed on an outer surface of a columnar element;
a dielectric element having a hole formed therein, the columnar element being disposed in the hole; and
an outer conductor formed on an outer surface of the dielectric element,
wherein the inner conductor has a multi-layer electrode structure in which conductor layers and dielectric layers are alternately laminated, an outermost conductor layer of the inner conductor is greater in thickness than the other conductor layers of the inner conductor, and the other conductor layers of the inner conductor are substantially equal in thickness, and
wherein the outer conductor has a multi-layer electrode structure in which conductor layers and dielectric layers are alternately laminated, an outermost conductor layer of the outer conductor is greater in thickness than the other conductor layers of the outer conductor, and the other conductor layers of the outer conductor are substantially equal in thickness.

4. The coaxial resonator according to Claim 3, wherein the inner conductor comprises a plurality of helical lines.

6. The coaxial resonator according to Claim 3 or 4, wherein phase constants of lines for the conductor layers are substantially equal in the inner conductor and the outer conductor.

7. The coaxial resonator according to Claim 3, further comprising a non-conducting element disposed between the columnar element and the dielectric element.

8. A filter comprising:

a plurality of coaxial resonators, each coaxial resonator comprising:

an inner conductor formed on an outer surface of a columnar element, wherein the inner conductor has a multi-layer electrode structure in which conductor layers and dielectric layers are alternately laminated, an outermost conductor layer of the inner conductor is greater in thickness than the other conductor layers of the inner conductor, and the other conductor layers of the inner conductor are substantially equal in thickness;

a dielectric element having a hole formed therein, the columnar element being disposed in the hole; and

an outer conductor formed on an outer surface of the dielectric element, wherein the outer conductor has a multi-layer electrode structure in which conductor layers and dielectric layers are alternately laminated, an outermost conductor layer of the outer conductor is greater in thickness than the other conductor layers of the outer conductor, and the other conductor layers of the outer conductor are substantially equal in thickness; and

an input/output device coupled to a predetermined coaxial resonator of the plurality of coaxial resonators.

10. A duplexer comprising:

a transmission filter disposed between a transmission signal input port and a transmission/reception signal input/output port; and

a reception filter disposed between the transmission/reception signal input/output port and a reception signal output port,

wherein at least one of the transmission filter and the reception filter includes a plurality of coaxial resonators, each coaxial resonator comprising:

an inner conductor formed on an outer surface of a columnar element, wherein the inner conductor has a multi-layer electrode structure in which conductor layers and dielectric layers are alternately laminated, an outermost conductor layer of the inner conductor is greater in thickness than the other conductor layers of the inner conductor, and the other conductor layers of the inner conductor are substantially equal in thickness;

a dielectric element having a hole formed therein, the columnar element being disposed in the hole; and

an outer conductor formed on an outer surface of the dielectric element, wherein the outer conductor has a multi-layer electrode structure in which conductor layers and dielectric layers are alternately laminated, an outermost conductor layer of the outer conductor is greater in thickness than the other conductor layers of the outer conductor, and the other conductor layers of the outer conductor are substantially equal in thickness; and

an input/output device coupled to a predetermined coaxial resonator of the plurality of coaxial resonators, the input/output device being coupled to a corresponding one of the ports.

11. A communication device comprising:
 - a high-frequency circuit comprising a transmission circuit and a reception circuit; and
 - a duplexer comprising:
 - a transmission filter disposed between a transmission signal input port and a transmission/reception signal input/output port; and
 - a reception filter disposed between the transmission/reception signal input/output port and a reception signal output port,wherein at least one of the transmission filter and the reception filter includes a plurality of coaxial resonators, each coaxial resonator comprising:
 - an inner conductor formed on an outer surface of a columnar element, wherein the inner conductor has a multi-layer electrode structure in which conductor layers and dielectric layers are alternately laminated, an outermost conductor layer of the inner conductor is greater in thickness than the other conductor layers of the inner conductor, and the other conductor layers of the inner conductor are substantially equal in thickness;
 - a dielectric element having a hole formed therein, the columnar element being disposed in the hole; and
 - an outer conductor formed on an outer surface of the dielectric element, wherein the outer conductor has a multi-layer electrode structure in which conductor layers and dielectric layers are alternately laminated, an outermost conductor layer of the outer conductor is greater in thickness than the other conductor layers of the outer conductor, and the other conductor layers of the outer conductor are substantially equal in thickness; and

an input/output device coupled to a predetermined coaxial resonator of the plurality of coaxial resonators and coupled to a corresponding one of the ports.

12. A communication device comprising:

a high-frequency circuit comprising at least one of a transmission circuit and a reception circuit, the high-frequency circuit comprising:

a plurality of coaxial resonators, each coaxial resonator comprising:

an inner conductor formed on an outer surface of a columnar element, wherein the inner conductor has a multi-layer electrode structure in which conductor layers and dielectric layers are alternately laminated, an outermost conductor layer of the inner conductor is greater in thickness than the other conductor layers of the inner conductor, and the other conductor layers of the inner conductor are substantially equal in thickness;

a dielectric element having a hole formed therein, the columnar element being disposed in the hole; and

an outer conductor formed on an outer surface of the dielectric element, wherein the outer conductor has a multi-layer electrode structure in which conductor layers and dielectric layers are alternately laminated, an outermost conductor layer of the outer conductor is greater in thickness than the other conductor layers of the outer conductor, and the other conductor layers of the outer conductor are substantially equal in thickness; and

an input/output device coupled to a predetermined coaxial resonator of the plurality of coaxial resonators.

21. A coaxial resonator comprising:
an inner conductor formed on an outer surface of a columnar element;
a dielectric element having a hole formed therein, the columnar element
being disposed in the hole; and
an outer conductor formed on an outer surface of the dielectric element,
wherein the inner conductor has a multi-layer electrode structure in which
conductor layers and dielectric layers are alternately laminated and wherein the
conductor layers of the inner conductor gradually decrease in thickness from an inner
most conductor layer toward an outermost conductor layer, and
wherein the outer conductor has a multi-layer electrode structure in which
conductor layers and dielectric layers are alternately laminated and wherein the
conductor layers of the inner conductor gradually increase in thickness from an inner
most conductor layer toward an outermost conductor layer.